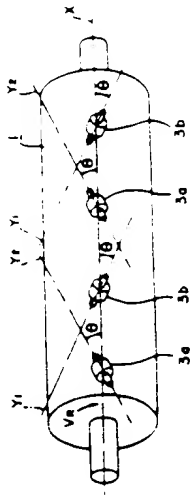
(54) ROTARY BODY GRINDING DEVICE
(11) 61-164772 (A) (43) 25.7.1986 (19) JP
(21) Appl. No. 60-2181 (22) 11.1.1985
(71) MITSUBISHI HEAVY IND LTD(1) (72) KANJI HAYASHI(4)
(51) Int. Cl⁴. B24B5/37,B21B28/04

PURPOSE: To enable uniform grinding of the whole surface of a rotary body by inclining the rotary axes of adjacent grinding bodies mutually in the opposite direction with respect to the axis of a rotary body to be machined.

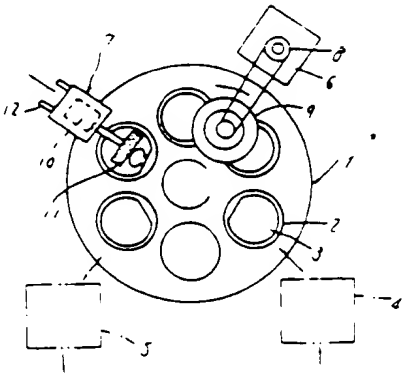
CONSTITUTION: When grinding wheels 3a, 3b are pressed to the surface of a rotating roll 2, the wheels 3a, 3b are rotated followingly due to the frictional force between them. The rotary axes of the wheels 3a, 3b are inclined at a required angle to the rotary axis of the roll 1, causing the wheels 3a, 3b to rotate relatively at their contact surfaces with the roll 1. The directions of the relative slide of the mutually adjacent wheels 3a, 3b are opposite to each other, and the wheel 3a carries out grinding with its right side up while the wheel 3b with its right side down. Thus, the grinding is carried out in two directions without being one-sided, thereby grinding the whole surface of the roll 1 uniformly.



(54) METHOD AND DEVICE FOR GRINDING WAFER
(11) 61-164773 (A) (43) 25.7.1986 (19) JP
(21) Appl. No. 60-5700 (22) 18.1.1985
(71) HITACHI LTD (72) TAKASHI SHIMURA(3)
(51) Int. Cl⁴. B24B7/22,H01L21/304

PURPOSE: To machine the surface of a wafer with high accuracy by finishingly grinding the surface of said wafer after carrying out rough grinding.

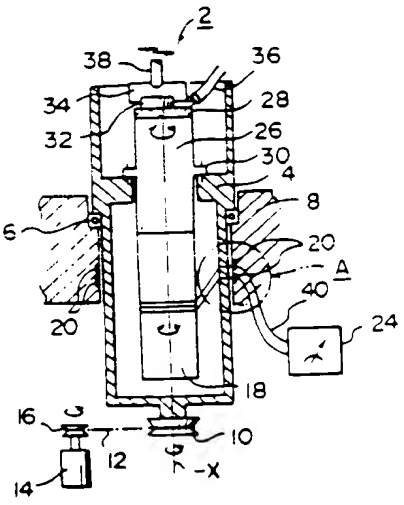
CONSTITUTION: After wafers 3 are delivered in order from a loader 4 onto the wafer chuck table 2 on a defined position of a rotary table 1 by means of a delivery mechanism, the wafer 3 is fixed and held with its circuit-formed surface faced up, on this table 2 by means of vacuum adsorption. The wafer 3 thus fixed and held is subjected to rough grinding by means of a cup wheel 9 of a rough grinding mechanism 6 while the rotary table 1 is rotated at a certain angle. Then, by further rotating the rotary table 1 at a certain angle, the wafer 3 is subjected to a plane surface grinding accurately by means of a straight grinding stone 11 during this rotation.



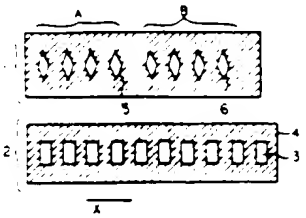
(54) VIBRATION POLISHING MACHINE
(11) 61-164774 (A) (43) 25.7.1986 (19) JP
(21) Appl. No. 60-860 (22) 9.1.1985
(71) CANON INC (72) TORU IMANARI
(51) Int. Cl⁴. B24B13/02

PURPOSE: To carry out polishing with high accuracy and favorably in a short time by providing a means of vibrating a polishing plate at a high vibrating frequency with a small amplitude and making the tracks of movement of abrasive grains with respect to a workpiece during a unit time complex and longer.

CONSTITUTION: The switch of an ultrasonic vibration generating device 24 is turned on, to make a vibrator 18 torsionally vibrate around an axis X with a minute amplitude, via a cord 40, a slip ring 20, etc. This torsional vibration is transmitted to a polishing plate 28 through a vibration transmitting horn 26, equally to make the end of the polishing plate 28 torsionally vibrate around the axis X with a minute amplitude of few microns. After rotating a rotary body 4 by driving a motor 14 under this condition, a plate glass (workpiece) 32 is pressed with a holder 34 and a supporting means 38 to be pushed against the polishing plate being torsionally vibrated, while feeding a polishing agent to the polishing plate 28 from a feeding pipe 26, to polish this plate glass 32 with the abrasive grains on the polishing plate 28 under ultrasonic vibration.

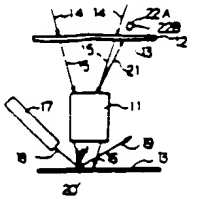


(54) ALIGNMENT SYSTEM
(11) 62-190726 (A) (43) 20.8.1987 (19) JP
(21) Appl. No. 61-32379 (22) 17.2.1986
(71) TOKYO ELECTRON LTD (72) HIROSHI UEHARA
(51) Int. Cl⁴. H01L21/30,G03F9/00,H01L21/68

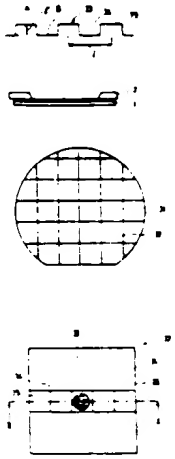


PURPOSE: To align masks and wafers at a high speed by forming the shape of repetition unit which forms a repetition pattern sequentially in narrower width toward both ends with the center of arranging direction in widest.

CONSTITUTION: The intervals of repetition patterns 1 on a mask and repetition patterns 2 on a wafer are equal. Rhombic window 5, 6 for passing many lights and nontransmission portions are formed at the same interval on the pattern 1 on the mask, and formed by displacing the phases by 1/2 pitch on the portions A, B. The lights emitted from the reflected portion 3 of the pattern 2 on the wafer pass the windows 5, 6 on the mask, the lights passed through the window 5 are detected by a detector 22A, and the light passed through the window 6 are detected by a detector 22B. The pattern 1 on the mask 12 completely coincides in range of the portion A with the pattern 2 on the wafer 13, and is displaced on the portion B. Thus, the output of the detector 22A becomes maximum, and the output of the detector 22B becomes minimum. Thus, since the variation in the potential increases with respect to the relative movements of the mask and the wafer near the "0" potential, they can be aligned accurately at high speed.



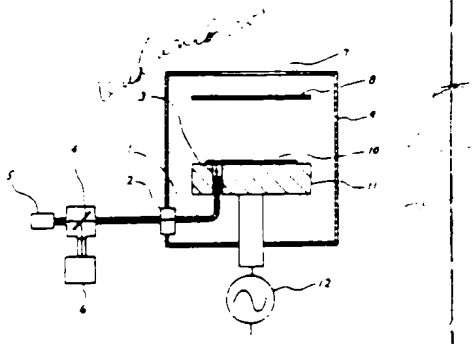
(54) TREATMENT OF SEMICONDUCTOR WAFER
(11) 62-190727 (A) (43) 20.8.1987 (19) JP
(21) Appl. No. 61-33233 (22) 17.2.1986
(71) FUJITSU LTD (72) KENJI SUGISHIMA(1)
(51) Int. Cl⁴. H01L21/30,G03F9/00,H01L21/68



PURPOSE: To accurately align masks by forming the surface of a semiconductor chip disposed under a Fresnel zone target formed on the mask in a projection or a recess.

CONSTITUTION: The alignment mark 33 of a Fresnel zone target is formed in a predetermined semiconductor chip 32 formed by a scribing line 31. Recess regions 34 and projection regins 35 are repeatedly formed at a pitch l, for example, of 5μm on the periphery of the mark 33. When the size l' from the surface A of the region 34 to the surface B of the region 35 becomes 1/4 λ, where λ is the wavelength of alignment light. Thus, since the light arrived at the surface f a semiconductor wafer 1 through the surface of the mask 2 and reflected on the surface does not partly coincide with the light reflected on the surface of the mask, they do not extremely strengthen nor weaken each other. Therefore, a difficulty of the erasure of the spot of the Fresnel zone target on the mask can be avoided.

(54) METHOD AND APPARATUS FOR MONITORING ETCHING END POINT
(11) 62-190728 (A) (43) 20.8.1987 (19) JP
(21) Appl. No. 61-31783 (22) 18.2.1986
(71) NIPPON TELEGR & TELEPH CORP <NTT>
(72) SHIGEYUKI TSURUMI(3)
(51) Int. Cl⁴. H01L21/302,C23F1/00,C23F4/00



PURPOSE: To eliminate the influence of contamination of a substance to be etched by introducing an infrared light of a predetermined wavelength to the surface of a semiconductor substrate of the side not formed with a thin metal film of the surface of the substrate, measuring the intensity of the light reflected on the thin film through the substrate of the infrared light, and obtaining the etching end point by the intensity of the reflected light to readily position a detector, thereby improving S/N ratio.

CONSTITUTION: The infrared light of 1.3μm of wavelength modulated by a sinusoidal wave of 1kHz from an infrared light emitting unit 5 is passed through a half mirror 4 to an optical fiber 1, and emitted to a silicon substrate 10 formed with the thin metal film as parallel beam via a rod lens 3. Part of the infrared light of 1.3μm of wavelength is reflected on the back surface of the substrate 10, but is passed through the Si, reflected on the metal film surface, again through the lens 3, and returned to the optical fiber 1. The returned infrared light is reflected on the half mirror 4, and detected by an infrared light detector 6. When the metal film is etched and removed by the plasma, the reflected light is erased from the metal film, thereby notifying the etching end point.

1: window, 9: upper electrode, 11: vacuum tank, 12: lower electrode, 13: RF power source